PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)*
Applicant's or agent's file reference NT1852PCT	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2004/019001	20.12.2004	06.02.2004

International Patent Classification (IPC) or both national classification and IPC

Applicant
Renesas Technology Corp.

1. This opinion contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP Facsimile No.	Authorized officer Telephone No.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019001

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

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☐ in computer readable form

c. time of filing/furnishing

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4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019001

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-18	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims		NO

2. Citations and explanations:

Document 1: JP 2002-512439 A (Energy Conversion Devices, Inc.), 23 April 2002, full text & WO 1999/054128 A1
Document 2: JP 2001-502848 A (Energy Conversion Devices, Inc.), 27 February 2001, full text & WO 1998/019350 A1
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Document 8: JP 2003-229537 A (Hitachi, Ltd.), 15 August 2003, full text & US 2003/0146469 A1

The storage disclosed in and supported by the specification and having the following (1) and (2) constitutions is not described in any of the documents cited in the ISR and is non-obvious to a person skilled in the art.

Therefore, the inventions of claims 1 through 18 are not described in any of the documents cited in the ISR and are non-obvious to a person skilled in the art.

(1) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019001

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

What is disclosed in the meaning of PCT Article 5 is obtaining high heat resistance in a phase-change memory by means of a storage having the following (1) and (2) constitutions.

(1) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

(2) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein it comprises a plurality of memory cells and a plurality of word lines for selecting the above-described memory cells and a plurality of data lines disposed so as to intersect the above-described plurality of word lines and for reading signals from the above-described plurality of memory cells; the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

Thus, what is disclosed in the meaning of PCT Article 5 is merely a very small part of the inventions of claims 1 through 18, and is not adequately supported in the meaning of PCT Article 6.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

(2) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein it comprises a plurality of memory cells and a plurality of word lines for selecting the above-described memory cells and a plurality of data lines disposed so as to intersect the above-described plurality of word lines and for reading signals from the above-described plurality of memory cells; the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

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1. This opinion contains indications relating to the following items:

- ☒ Box No. I — Basis of the opinion
- ☐ Box No. II — Priority
- ☐ Box No. III — Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV — Lack of unity of invention
- ☒ Box No. V — Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI — Certain documents cited
- ☐ Box No. VII — Certain defects in the international application
- ☒ Box No. VIII — Certain observations on the international application

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WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/019001

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-18	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-18	YES
	Claims		NO

2. Citations and explanations:

Document 1: JP 2002-512439 A (Energy Conversion Devices, Inc.), 23 April 2002, full text & WO 1999/054128 A1
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Supplemental Box

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Continuation of: Box V

(2) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein it comprises a plurality of memory cells and a plurality of word lines for selecting the above-described memory cells and a plurality of data lines disposed so as to intersect the above-described plurality of word lines and for reading signals from the above-described plurality of memory cells; the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

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Novelty (N)	Claims	1-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-18	YES
	Claims		NO
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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

(2) A storage consisting of a storage layer that stores information by causing a reversible phase change between a crystalline phase and a noncrystalline phase, wherein it comprises a plurality of memory cells and a plurality of word lines for selecting the above-described memory cells and a plurality of data lines disposed so as to intersect the above-described plurality of word lines and for reading signals from the above-described plurality of memory cells; the total content of at least one element selected from the group consisting of Ge and Sb or at least one element selected from the group consisting of Ge and Sb, and Bi is equal to or greater than 2 atom% and less than 25 atom%, the content of Te is equal to or greater than 40 atom% and equal to or less than 65 atom%, and the total content of at least one element selected from the group consisting of Zn or Zn and Co and N is equal to or greater than 20 atom% and less than or equal to 50 atom% and consisting of a memory element that has an electrode formed with the above-described storage layer on both faces.

特許協力条約

発信人　日本国特許庁（国際調査機関）

出願人代理人
　小川　勝男

様

あて名

〒 104-0033
東京都中央区新川一丁目３番３号第１７荒井ビル８
階日東国際特許事務所

ＰＣＴ
国際調査機関の見解書
（法施行規則第40条の2）
〔ＰＣＴ規則43の2.1〕

発送日 （日.月.年）	08.02.2005
出願人又は代理人 の書類記号　NT1852PCT	今後の手続きについては、下記２を参照すること。

国際出願番号	国際出願日 （日.月.年）	優先日 （日.月.年）
ＰＣＴ／ＪＰ２００４／０１９００１	２０．１２．２００４	０６．０２．２００４

国際特許分類（ＩＰＣ）
Ｉｎｔ．Ｃｌ⁷　Ｈ０１Ｌ２７／１０　Ｇ１１Ｃ１３／００　Ｇ１１Ｂ７／２４　Ｈ０１Ｌ４５／００

出願人（氏名又は名称）
株式会社ルネサステクノロジ

１．この見解書は次の内容を含む。
- [X] 第Ⅰ欄　見解の基礎
- [ ] 第Ⅱ欄　優先権
- [ ] 第Ⅲ欄　新規性、進歩性又は産業上の利用可能性についての見解の不作成
- [ ] 第Ⅳ欄　発明の単一性の欠如
- [X] 第Ⅴ欄　ＰＣＴ規則43の2.1(a)(i)に規定する新規性、進歩性又は産業上の利用可能性についての見解、それを裏付けるための文献及び説明
- [ ] 第Ⅵ欄　ある種の引用文献
- [ ] 第Ⅶ欄　国際出願の不備
- [X] 第Ⅷ欄　国際出願に対する意見

２．今後の手続き
国際予備審査の請求がされた場合は、出願人がこの国際調査機関とは異なる国際予備審査機関を選択し、かつ、その国際予備審査機関がＰＣＴ規則66.1の2(b)の規定に基づいて国際調査機関の見解書を国際予備審査機関の見解書とみなさない旨を国際事務局に通知していた場合を除いて、この見解書は国際予備審査機関の最初の見解書とみなされる。

この見解書が上記のように国際予備審査機関の見解書とみなされる場合、様式ＰＣＴ／ＩＳＡ／２２０を送付した日から３月又は優先日から２２月のうちいずれか遅く満了する期限が経過するまでに、出願人は国際予備審査機関に、適当な場合は補正書とともに、答弁書を提出することができる。

さらなる選択肢は、様式ＰＣＴ／ＩＳＡ／２２０を参照すること。

３．さらなる詳細は、様式ＰＣＴ／ＩＳＡ／２２０の備考を参照すること。

見解書を作成した日
２６．０１．２００５

名称及びあて先
日本国特許庁（ＩＳＡ／ＪＰ）
郵便番号１００－８９１５
東京都千代田区霞が関三丁目４番３号

特許庁審査官（権限のある職員）　４Ｌ　８４２１
河口　雅英

電話番号　０３－３５８１－１１０１　内線　３４６２

国際調査機関の見解書

国際出願番号　PCT／JP2004／019001

第Ⅰ欄　見解の基礎

1．この見解書は、下記に示す場合を除くほか、国際出願の言語を基礎として作成された。

☐ この見解書は、＿＿＿＿＿＿＿＿語による翻訳文を基礎として作成した。
それは国際調査のために提出されたＰＣＴ規則12.3及び23.1(b)にいう翻訳文の言語である。

2．この国際出願で開示されかつ請求の範囲に係る発明に不可欠なヌクレオチド又はアミノ酸配列に関して、以下に基づき見解書を作成した。

a．タイプ
☐ 配列表
☐ 配列表に関連するテーブル

b．フォーマット
☐ 書面
☐ コンピュータ読み取り可能な形式

c．提出時期
☐ 出願時の国際出願に含まれる
☐ この国際出願と共にコンピュータ読み取り可能な形式により提出された
☐ 出願後に、調査のために、この国際調査機関に提出された

3．☐ さらに、配列表又は配列表に関連するテーブルを提出した場合に、出願後に提出した配列若しくは追加して提出した配列が出願時に提出した配列と同一である旨、又は、出願時の開示を超える事項を含まない旨の陳述書の提出があった。

4．補足意見：

国際調査機関の見解書

国際出願番号 ＰＣＴ／ＪＰ２００４／０１９００１

第Ⅴ欄　新規性、進歩性又は産業上の利用可能性についてのＰＣＴ規則43の2.1(a)(i)に定める見解、それを裏付ける文献及び説明

1．　見解

新規性（N）　請求の範囲 １－１８　有
請求の範囲 ＿＿＿＿＿＿＿＿　無

進歩性（ＩＳ）　請求の範囲 １－１８　有
請求の範囲 ＿＿＿＿＿＿＿＿　無

産業上の利用可能性（ＩＡ）　請求の範囲 １－１８　有
請求の範囲 ＿＿＿＿＿＿＿＿　無

2．　文献及び説明

文献１：ＪＰ　２００２－５１２４３９　Ａ（エナージー　コンバージョン　デバイセス　インコーポレイテッド）２００２．０４．２３，全文
&WO　１９９９／０５４１２８　Ａ１
文献２：ＪＰ　２００１－５０２８４８　Ａ（エナージー　コンバージョン　デバイセス　インコーポレイテッド）２００１．０２．２７，全文
&WO　１９９８／０１９３５０　Ａ１
文献３：ＪＰ　１１－５１４１５０　Ａ（エナージー　コンバージョン　デバイセス　インコーポレイテッド）１９９９．１１．３０，全文
&WO　１９９７／０１５９５４　Ａ１
文献４：ＪＰ　１１－５１０３１７　Ａ（エナージー　コンバージョン　デバイセス　インコーポレイテッド）１９９９．０９．０７，全文
&WO　１９９７／００５６６５　Ａ１
文献５：WO　２００３／０５０８７２　Ａ１（MATSUSHITA ELECTRIC INDUSTRIAL CO.,LTD）２００３．０６．１９，全文
文献６：WO　２０００／０５４９８２　Ａ１（MATSUSHITA ELECTRIC INDUSTRIAL CO.,LTD）２０００．０９．２１，全文
文献７：ＪＰ　５５－００８８３０　Ｂ１（松下電器産業株式会社）１９８０．０３．０６，全文
文献８：ＪＰ　２００３－２２９５３７　Ａ（株式会社日立製作所）２００３．０８．１５，全文
&US　２００３／０１４６４６９　Ａ１

明細書に開示され、裏付けられている下記（１）及び（２）の構成を有する記憶装置について、国際調査報告に引用されたいずれの文献にも記載されておらず、当業者にとって自明なものでもない。
したがって、請求の範囲１乃至１８に係る発明は、国際調査報告に引用されたいずれの文献にも記載されておらず、当業者にとって自明なものでもない。

（１）Ｇｅ及びＳｂよりなる群から選ばれた少なくとも１元素、又はＧｅ及びＳｂよりなる群から選ばれた少なくとも１元素並びにＢｉを合計で２原子％以上２５原

国際調査機関の見解書

国際出願番号　PCT／JP2004／019001

第Ⅷ欄　国際出願に対する意見

請求の範囲、明細書及び図面の明瞭性又は請求の範囲の明細書による十分な裏付についての意見を次に示す。

ＰＣＴ第５条の意味において開示されているのは、下記（１）及び（２）の構成を有する記憶装置によって、相変化メモリにおいて高い耐熱性を得たことである。

（１）Ｇｅ及びＳｂよりなる群から選ばれた少なくとも１元素、又はＧｅ及びＳｂよりなる群から選ばれた少なくとも１元素並びにＢｉを合計で２原子％以上２５原子％未満、Ｔｅを４０原子％以上６５原子％以下、Ｚｎ、又はＺｎ並びにＣｏ及びＮよりなる群から選ばれた少なくとも１元素を合計で２０原子％以上５０原子％以下それぞれ含み、結晶相と非晶質相との間で可逆的な相変化を起こすことにより情報を記憶する記憶層と、前記記憶層の両面に形成された電極とを有するメモリ素子からなる記憶装置。

（２）複数のメモリセルと前記複数のメモリセルを選択する複数のワード線と、前記複数のワード線と直交するように配置され、前記複数のメモリセルから信号が読み出される複数のデータ線とを有し、前記複数のメモリセルの各々は、Ｇｅ及びＳｂよりなる群から選ばれた少なくとも１元素、又はＧｅ及びＳｂよりなる群から選ばれた少なくとも１元素並びにＢｉを合計で２原子％以上２５原子％未満、Ｔｅを４０原子％以上６５原子％以下、Ｚｎ、又はＺｎ並びにＣｏ及びＮよりなる群から選ばれた少なくとも１元素を合計で２０原子％以上５０原子％以下それぞれ含み、結晶相と非晶質相との間で可逆的な相変化を起こすことにより情報を記憶する記憶層と、前記記憶層の両面に形成された電極とを有する記憶装置。

そうすると、ＰＣＴ第５条の意味において開示されているのは、請求の範囲１乃至１８に係る発明のごくわずかな部分にすぎず、ＰＣＴ第６条の意味で十分に裏付けられていない。

補充欄

いずれかの欄の大きさが足りない場合

第　V　欄の続き

子%未満、Ｔｅを４０原子%以上６５原子%以下、Ｚｎ、又はＺｎ並びにＣｏ及びＮよりなる群から選ばれた少なくとも１元素を合計で２０原子%以上５０原子%以下それぞれ含み、結晶相と非晶質相との間で可逆的な相変化を起こすことにより情報を記憶する記憶層と、前記記憶層の両面に形成された電極とを有するメモリ素子からなる記憶装置。

（２）複数のメモリセルと前記複数のメモリセルを選択する複数のワード線と、前記複数のワード線と直交するように配置され、前記複数のメモリセルから信号が読み出される複数のデータ線とを有し、前記複数のメモリセルの各々は、Ｇｅ及びＳｂよりなる群から選ばれた少なくとも１元素、又はＧｅ及びＳｂよりなる群から選ばれた少なくとも１元素並びにＢｉを合計で２原子%以上２５原子%未満、Ｔｅを４０原子%以上６５原子%以下、Ｚｎ、又はＺｎ並びにＣｏ及びＮよりなる群から選ばれた少なくとも１元素を合計で２０原子%以上５０原子%以下それぞれ含み、結晶相と非晶質相との間で可逆的な相変化を起こすことにより情報を記憶する記憶層と、前記記憶層の両面に形成された電極とを有する記憶装置。